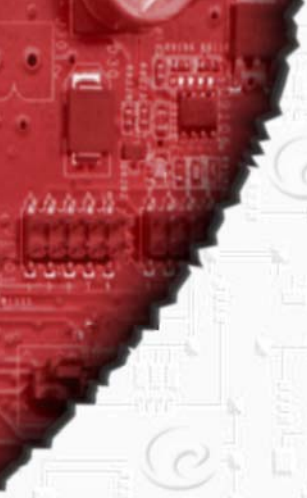
QuadroE1/T1

The VoIP Gateway



Manual I:
Installation Guide

for QuadroE1/T1, SW-Version 3.0.x

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Epygi Technologies, Ltd. ('Epygi') warrants to the original end-user purchaser every QuadroE1/T1 to be free from physical defects in material and workmanship under normal use for a period of one (1) year from the date of purchase (proof of purchase required). If Epygi receives notice of such defects, Epygi, at its discretion, will repair or replace products that prove to be defective.

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FCC Statement (Part 15) Class A

The Epygi Quadro has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and device
- Connect the equipment to an outlet different from the receiver
- Consult a dealer or an experienced Radio/TV technician for assistance

You are cautioned that any change or modification to the equipment not expressly approved by the manufacturer could void the user's authority to operate this device.

Administrative Council for Terminal Attachments (ACTA) Customer Information

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ATCA.

If the QuadroE1/T1 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of the QuadroE1/T1 does not disable your alarm equipment. If you have any questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

Electrical Safety Advisory

To reduce the risk of damaging power surges, we recommend you install a quality AC surge suppressor in the AC outlet from which the QuadroE1/T1 is powered.

Industry Canada Statement

This product meets the applicable Industry Canada technical specifications.

Safety Information

Before using the QuadroE1/T1, please review and ensure the following safety instructions are adhered to:

- To prevent fire or shock hazard, do not expose your QuadroE1/T1 to rain or moisture.
- To avoid electrical shock, do not open the QuadroE1/T1. Refer servicing to qualified personnel only.
- Never install wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specified for wet locations.
- Never touch un-insulated telephone wire or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying cable or telephone lines.
- Avoid using your QuadroE1/T1 during an electrical storm.
- Do not use your QuadroE1/T1 or telephone to report a gas leak in the vicinity of the leak.
- An electrical outlet should be as close as possible to the unit and easily accessible.

Emergency Services

The QuadroE1/T1 SIP Service is intended to function as a secondary telephone service. These services are made available through the Internet and therefore are dependent upon a constant source of electricity and network availability. In the event of a power outage, the QuadroE1/T1 SIP Service will automatically be disabled. User understands that in the event of a power or network outage, the QuadroE1/T1 SIP Service will not support 911 emergency services and further that such services will only be available via the user's regular telephone line not connected to the QuadroE1/T1. User further acknowledges that any interruption in the supply or delivery of electricity or network availability is beyond Epygi's control and that Epygi shall have no responsibility for losses arising from such interruption.

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Manual II: see Administrator's Guide

Describes in detail the QuadroE1/T1 management menus and includes all system default values at a glance, too.

About This Installation Guide

This Installation Guide explains the installation of the QuadroE1/T1 VoIP gateway. It gives step-by-step instructions to provision the QuadroE1/T1 and configure the phone extensions with the Epygi SIP Server. After successfully configuring the QuadroE1/T1, a user will be able to make SIP phone calls to remote QuadroE1/T1 devices, make local calls to the PSTN and access the Internet from devices connected to the LAN.

This Installation Guide does not provide advanced configuration information. For these features, refer to the Administrator's Guide.

Installing QuadroE1/T1 explains connection of cables and devices to the Quadro.

Configuring the QuadroE1/T1 describes the configuration steps necessary to integrate the Quadro into a network environment and to setup the voice features. The chapter includes information about the System and Internet Configuration Wizards to integrate the QuadroE1/T1 in your network environment, about the basic E1/T1 settings and about the basic setting up of the call routing functionality.

Please Note: The Quadro configuration described in this Installation Guide describes basic configurations. For more complex configurations, please refer to the Quadro Administrator's Manual.

Registering on Epygi's Technical Support shows you how to gain access to the Epygi Technical Support Center and the Epygi SIP Server.

Appendix: PC DHCP Settings explains how to configure your PC to access the Quadro configuration GUI.

Appendix: Changing the Administrator's Password explains how to change the default administrator password.

Appendix: Configuring SIP NAT Traversal explains configuration of the Quadro if it is placed behind a NAT enabled router.

Appendix: Checking the Connections gives hints to solve common problems.

Requirements

- One 120/240 V power outlet in close proximity to the QuadroE1/T1.
- One RJ-45 Ethernet 10/100 broadband Internet connection.
- One off-the-shelf analog phone with an RJ-11 telephone cable.
- One CAT 5 Ethernet cable with an RJ-45 connector to connect to the QuadroE1/T1 LAN port
- One PC with a 10Mbps or a 10/100 Mbit/s Ethernet card or adapter installed.
- TCP/IP network protocol installed on each PC.
- For optimal results, Internet Explorer 5.5 or higher, or Netscape Navigator 4.7 or higher are recommended.)

Please Note: The QuadroE1/T1 is shipped with one RJ-11 cable and one straight RJ-45 CAT 5 cable. If the LAN connector of the QuadroE1/T1 is to be connected to a hub or switch, a crossover cable may be required (see Appendix: Pin Assignment of E1/T1, too).

Hardware Overview

QuadroE1/T1's Rear Panel

Fig. I-1: QuadroE1/T1's backplate

1 Power supply socket. **Use only the power adapter delivered with the QuadroE1/T1**.

2 PHONE socket with a RJ-11 connector enables connectivity of a regular analog telephone. This is a FXS (Foreign Exchange Station) analog port.

3 RJ-45 socket to attach the Local Area Network (LAN) via an Ethernet CAT 5 cable. If a PC is connected directly to this socket, a straight cable is used. If an Ethernet hub, router or switch is used, a crossover cable may be required.

4 RJ-45 socket to attach the Internet Uplink (WAN) via an Ethernet CAT 5 cable.

5 RJ-45 socket to attach the E1/T1 trunk. See Appendix: Pin Assignment of E1/T1.

6 The Reset button may be used in two ways: (1) to initiate a normal reset, (2) to carry out a factory reset. A normal reset is executed by pressing the Reset button with a paper clip for an instant.

Pressing the reset button and holding it down for 7 seconds or more will execute a factory reset. This will restore the factory defaults and clear all settings including the IP address and the administration password you entered.

Please Note: A Factory Reset forces the default LAN IP address of 172.30.0.1 and default administrator's password of 19.

QuadroE1/T1's Front Panel LEDs

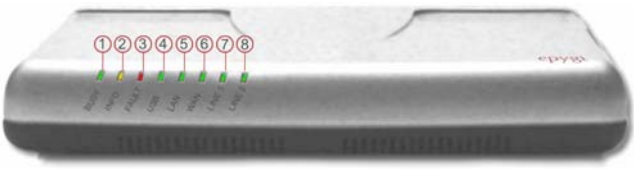


Fig. I-2: QuadroE1/T1's Front Panel LEDs

1	**BUSY** green (Status of the CPU)	**on:** device is booting **off**: No power **blinking**: activity
2	**INFO** yellow (System information)	**on**: device is booting **off**: no information **blinking**: an event occurred that was specified in Event Management
3	**FAULT** red (System status)	**on** device is booting/ error **off**: no error **blinking**: system unusable
4	**SPARE** green	**off**: undefined
5	**LAN** green (Status of the LAN interface)	**on**: link ok **off**: no link **flickering**: traffic on the link
6	**WAN** green (Status of the WAN interface)	**on**: link ok **off**: no link **flickering**: traffic on the link
7	**Line1** green (Status of the E1/T1 link)	**on:** frame synchronization is ok **off**: frame synchronization is not ok **flickering**: link is down
8	**Line2** green (Status of the E1/T1 link)	**on:** Link ok **off**: RED alarm indication **flickering**: link is down

LED Indication during a firmware update

A firmware update is indicated by the red (**Fault**) and yellow (**Info**) LED. Both will blink simultaneously for about five minutes while the firmware is updated. The QuadroE1/T1 will then re-boot automatically showing the boot LED sequence.

LED Indication during a boot sequence

A boot sequence is indicated as follows: The red **Fault** LED will glow for a few seconds, then the yellow **Info** LED will glow for another four or five minutes while the green **Busy** LED is blinking. Once the **Info** LED is off, the boot sequence has been completed successfully.

Installing QuadroE1/T1

Networking Overview

To establish a connection between the PSTN (or your PBX) and the Internet, a VoIP gateway is needed. The QuadroE1/T1 is a VoIP gateway, and will perform the task of connecting your PSTN (or PBX) via its E1/T1 port to a Private Data Network that includes Quadro SIP routers (Quadro2x, -4x and/or16x) or the Internet. The QuadroE1/T1 will process and regulate the voice traffic between these networks by means of Call Routing paths that are specified by the administrator according to a dial plan. The QuadroE1/T1 has one additional LAN port that is used to connect a PC for management purposes. The WAN port transmits up to 10 Mbps, and the LAN port transmits at 10 Mbps or 100 Mbps.

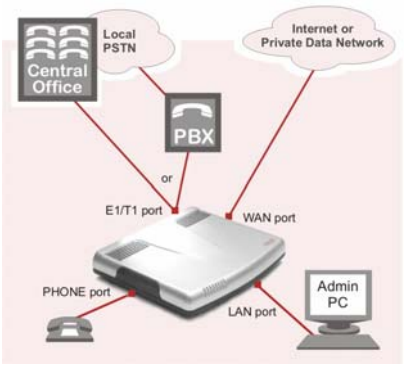


Fig. I-3: Connection overview

Every device within an IP network requires a unique IP address to identify itself. Since the QuadroE1/T1 connects to both the LAN (Admin PC) and the WAN (Private Data Network or Internet), it has to be part of both networks, and must have two IP addresses: one for the WAN side and one for the LAN side. The QuadroE1/T1's integrated firewall/NAT functionality will hide the LAN IP address from the WAN (Internet) side.

There are two ways of assigning an IP address: statically or dynamically. The Quadro E1/T1 can be configured with a static IP address on the WAN interface. You also can use a DHCP server assigned IP address on the WAN side.

Please Note: A DHCP client is software that requests an IP address from a DHCP server. A DHCP server assigns on request a unique IP address to a device. The QuadroE1/T1 acts as a DHCP client on its WAN interface and as a DHCP server on its LAN interface.

Connecting the Hardware

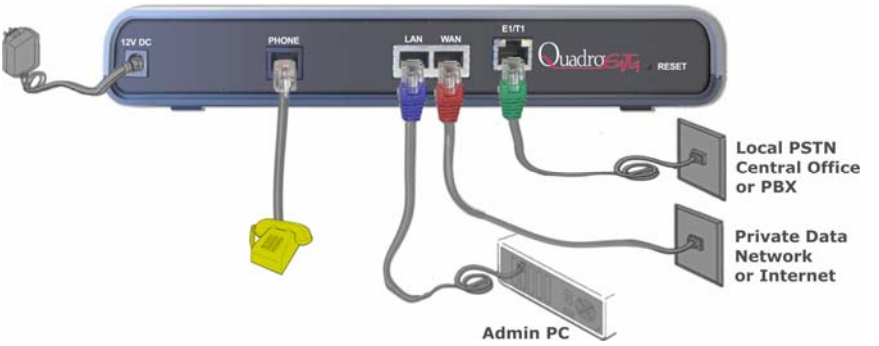


Fig. I-4: Connecting the Hardware

- Verify the product package contents are complete. Refer to the contents sheet included in the packaging to determine if all the items were shipped in the box.
- Connect a telephone to the PHONE port on the QuadroE1/T1's rear panel.
- **Connect the QuadroE1/T1's E1/T1 port to your PBX or the trunk from the PSTN Central Office ONLY after configuring the E1/T1 settings according to the specifications of your PSTN provider** (see Appendix: Pin Assignment of E1/T1).
- Connect the Ethernet port on your PC via a straight CAT 5 cable with an RJ-45 connector to the LAN socket of the QuadroE1/T1. If a hub or switch is connected between the QuadroE1/T1 and your PC, use a crossover cable from the LAN interface of the QuadroE1/T1 to the hub/switch.
- Connect the WAN port of the QuadroE1/T1 to the Private Data Network or Internet service.
- When using a DSL or Cable modem, power up the modem before the Quadro.
- Connect the power adapter to the POWER port on the QuadroE1/T1's rear panel and plug the power adapter into a power outlet. Only use the original power adapter and plug it into a power strip with surge protection or to a UPS if available.
  The red LED (Fault) will glow for several seconds followed by the yellow LED (Info), which will glow for several minutes. As soon as Info is off, the QuadroE1/T1 is operational.
- Power up any hub or switch followed by any PC and other devices on the LAN side.
  Please Note: The PC must be configured for DHCP to receive an IP address directly from the QuadroE1/T1. Refer to Appendix: PC DHCP Settings for instructions on how to set up a PC for DHCP operation.
- Check the LEDs: The green Busy LED should glow continuously. The green LAN and WAN LEDs will blink when cables are connected to these ports and all devices are powered up. If the green LAN and WAN LEDs do not blink, verify cabling and ensure that all devices are powered up.
  Please Note: CAT 5 cables can be faulty without visual indication. The LAN and WAN LEDs verify that the Ethernet connection is established between the end points. If these LEDs are not illuminated, there is a connection problem between the QuadroE1/T1 and the other device. Some modems, hubs, switches and routers will require the use of crossover cables.

Configuring the QuadroE1/T1

To configure the QuadroE1/T1 basically, four steps are needed:

Step1: Basic Configuration using the System Configuration Wizard and the Internet Configuration Wizard

Step 2: Entering the **E1/T1 settings** provided by your PSTN Provider

Step 3: Specifying the **Call Routing paths** according to your dial plan

The most important settings required in **Step 1: Basic Configuration** are:

Static IP address for the WAN Interface. If you use a DHCP server, please configure it to deliver a static IP address. In this case, QuadroE1/T1 will get its IP address automatically, as it acts as a DHCP client on the WAN side.

Bandwidth - to regulate the number of calls allowed by the QuadroE1/T1 to avoid degradation in low bandwidth conditions.

Regional Settings - if your QuadroE1/T1 is located outside the United States, it is important to properly configure your line connections to the PSTN in your location

Firewall - if your QuadroE1/T1 is connected behind a router configure the firewall to make the QuadroE1/T1 accessible for management.

To customize these settings, connect a PC to QuadroE1/T1's LAN port, log in and complete the **Basic Configuration** as described in the following sections.

Logging in to QuadroE1/T1

Start a browser (MS Internet Explorer, Netscape, Opera) on a PC connected to the LAN port.

Enter **http://172.30.0.1** (QuadroE1/T1's default LAN IP address) into the address field.

The **Login** page of the QuadroE1/T1 will be displayed (see picture below)

Fig. I-5: QuadroE1/T1's login page

Enter **admin** as the Username and **19** as the Password to log in as the administrator.

After logging in, the **QuadroE1/T1 Management** page will be displayed.

Please Note: If you enter a wrong password and/or username five times, the device will be unavailable for login for five minutes

Fig. I-6: QuadroE1/T1's Management page

Basic Configuration

Two Configuration Wizards are available to accomplish the basic configuration of Quadro devices:

- **The System Configuration Wizard** - a tool for the administrator to define the Quadro's Local Area Network settings and to specify regional configuration settings to make Quadro operational in its LAN. It must be run upon Quadro first startup.
- **The Internet Configuration Wizard** - a tool for the administrator to configure the WAN settings and to adjust Quadro's connectivity in the global network. It must be run if Quadro is desired to be connected to the Internet.

Please Note: It is strongly recommended that factory default settings are left unchanged if their meanings are not completely clear.

Run the System Configuration Wizard

Open the **System Configuration Wizard** by selecting the corresponding menu item on the **System** menu. The page **Getting Started** will be displayed:

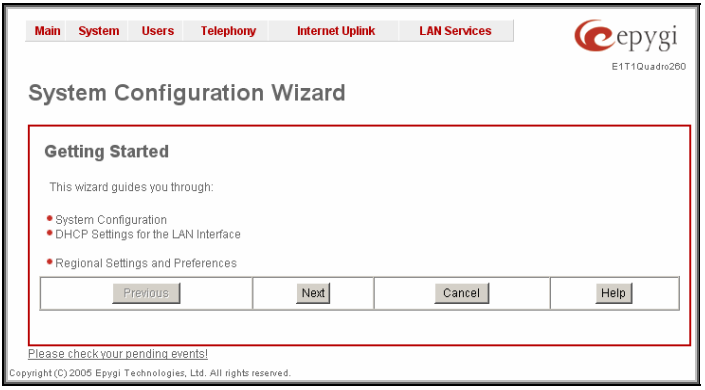


Fig. I-7:System Configuration Wizard

This first page of the System Configuration Wizard is for information only and lists the items to be configured, Click on the **Next** button to get to the **System Configuration** page.

System Configuration

Enter into the **Host Name** field a unique name for the QuadroE1/T1. This is useful when many Quadro's are part of a network and one administrator has remote access to all of them. All Web Management pages show this **Host Name** in the top right corner.

For a basic configuration, the **LAN IP address** needn't be changed. If you have to change it, e.g. to integrate the device into an existing LAN, insert the new LAN IP address and have it handy. You need it to re-access Quadro management.

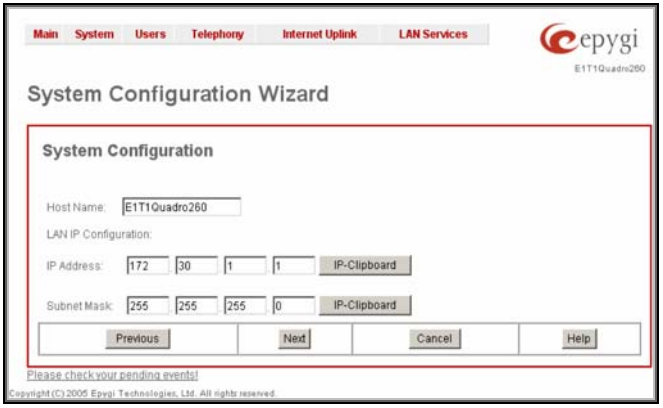


Fig. I-8: System Configuration page

Clicking **Next** shows the page DHCP Settings for the LAN Interface

DHCP Settings for the LAN Interface

If the DHCP server is enabled, the QuadroE1/T1 will assign dynamic IP addresses to the Admin PC connected to its LAN port.

If you didn't change the default IP address of the QuadroE1/T1, you may also leave the default values for **IP Address Range**. Make sure your connected Admin PC belongs to the same network as the LAN port of your QuadroE1/T1.

Please Note: Make sure there is only one DHCP server on the LAN. Otherwise, unpredictable network behavior can occur.

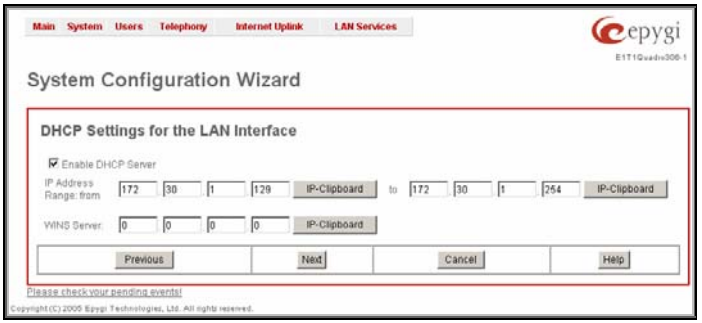


Fig. I-9: DHCP Settings for the LAN Interface page

Click on **Next** to display the **Regional Settings** page.

Regional Settings

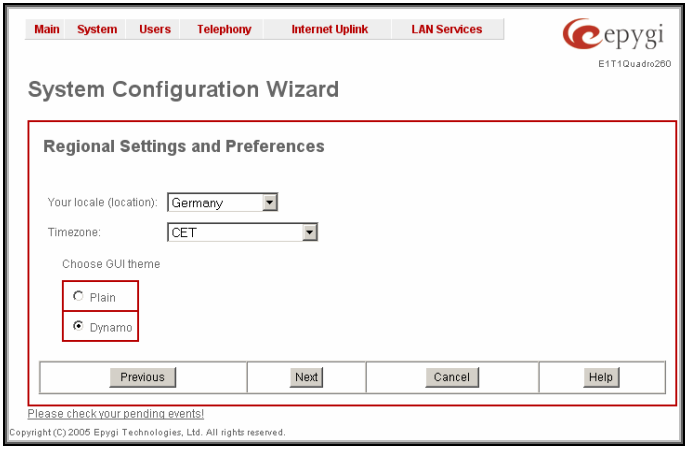


Fig. I-10: Regional Settings page

Proper configuration of **Regional Settings** is important to the functionality of the voice subsystem. The Regional Settings determine the proper telephony parameters for the specified country. Select the country where the QuadroE1/T1 is located. If you do not find your country in the list, pick the closest. If this setting does not work, issue a request to Epygi technical support under the Support section of www.epygi.com.

The Quadro gets the correct time automatically over the Internet from a time server. If you are not located in US / Central Standard Time Zone, you will need to change the **Timezone** to your region.

Click **Next** to show the summary page.

Finishing the System Configuration Wizard

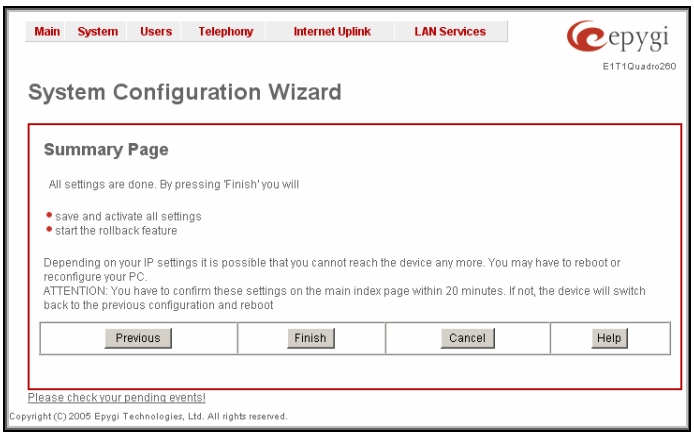

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
E1T1Quadro260
System Configuration Wizard
Summary Page
All settings are done. By pressing 'Finish' you will
save and activate all settings
start the rollback feature
Depending on your IP settings it is possible that you cannot reach the device any more. You may have to reboot or reconfigure your PC.
ATTENTION: You have to confirm these settings on the main index page within 20 minutes. If not, the device will switch back to the previous configuration and reboot
Previous
Finish
Cancel
Help
Please check your pending events!
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. I-11: System Configuration Wizard finishing page

Click the **Finish** button to complete the System Configuration Wizard. The Quadro will then stop internal functions and apply the changes made in the wizard.

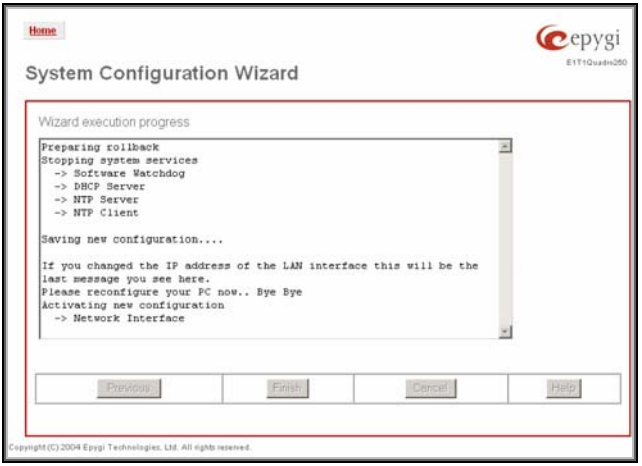


Fig. I-12: Wizard execution process

After this is complete, the Quadro will reply with the **Confirm Settings** page requesting confirmation of the changes. Press the **OK** button to confirm the settings.

Home
epygi
Confirm settings
Please press the 'Ok' button to confirm the settings.
If you don't press 'Ok' within 20 minutes after start the system
restores the previous configuration
Ok
Copyright (C) 2004 Epygi Technologies, Ltd. All rights reserved.

Fig. I-13: Confirm Settings page

Please Note: you must confirm the settings within 20 minutes. If not, the device will **revert back to the previous configuration and reboot**.

Please Note: If you do not use DHCP for your LAN and you have changed your LAN settings, make sure that the IP address of the PC connected to Quadro is still within the specified IP address range. Otherwise, your PC might be unable to establish a connection to Quadro.

If you changed the network configuration of the LAN, you may have to reboot your PC to get a new IP address from the new network. You can then access the Web Management of the Quadro on the new IP address you assigned to the Quadro.

Run the Internet Configuration Wizard

Open the **Internet Configuration Wizard** by selecting the corresponding menu item on the **System** menu. The page **Getting Started** will be displayed:

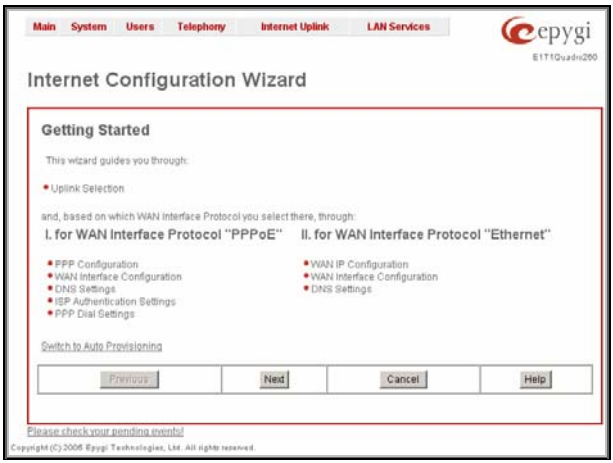


Fig. I-14: Internet Configuration Wizard

This first page of the Internet Configuration Wizard is for information only and lists the items to be configured, Click on the **Next** button to get to the **Uplink Configuration** page.

Uplink Configuration

Select here the **WAN Interface Protocol** required by you ISP: **PPPoE** (Point to Point Protocol over Ethernet) or **Ethernet**.

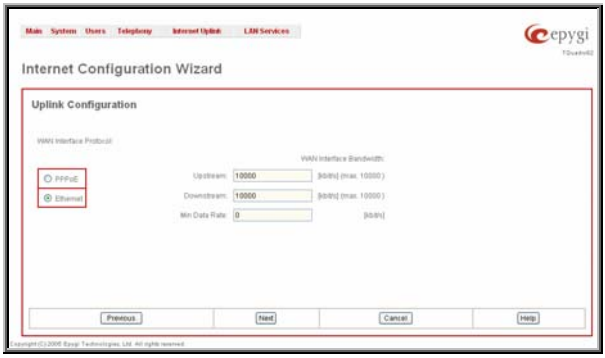


Fig. I-15:Uplink Configuration

Enter **WAN Interface Bandwidth** to assure the quality of IP calls. If available bandwidth is used to the point of which the quality of an additional IP call would suffer, new IP calls are rejected.

The bandwidth provided by your ISP must be specified for both **Upstream** and **Downstream** fields**.** The default entry in both fields is **10000,** the maximum bandwidth of the 10 MB uplink module.

The **Min Data Rate** text field is used to specify the amount of bandwidth reserved for data applications. The value entered here has to be smaller that the value specified for **Upstream Bandwidth**. Specify the **WAN Interface Protocol** by choosing between **PPPoE** (Point to Point over Ethernet) and **Ethernet**. Use Ethernet for DHCP or static IP.

Clicking **Next** shows **WAN IP Configuration** page**.** If **PPPoE** is the selected WAN Interface Protocol**,** the next page will be **PPP Configuration.**

WAN IP Configuration

Your Internet Service Provider (ISP) should provide this information.

- **Assign automatically via DHCP** - The parameters are set automatically by the ISP. This is common with cable modem and DSL service.
- **Assign Manually** requires the administrator to enter the external **IP Address**, the corresponding **Subnet Mask**, and the IP address of the **Standard Gateway**. This is common when you have a static IP address with your ISP.

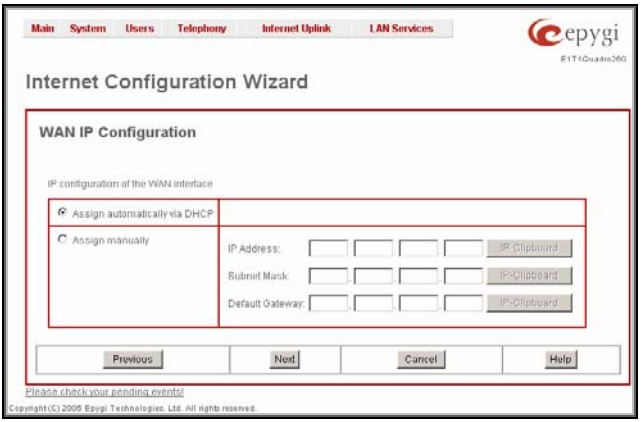


Fig. I-16: WAN IP Configuration page

Click the **Next** button to display the **WAN Interface Configuration** page.

PPP Configuration

The **IP Address Assignment** field is used to specify the external IP address. As the QuadroE1/T1 requires a static WAN IP address, you will select Fixed IP Address in most cases.

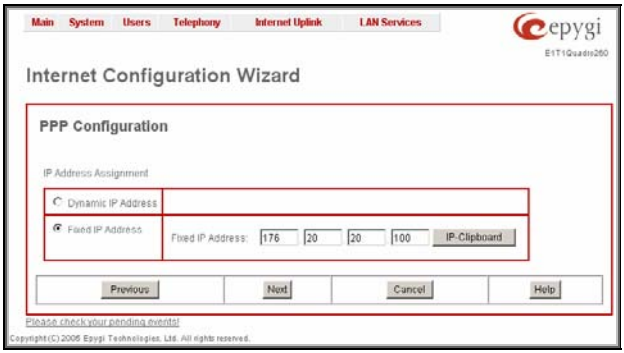


Fig. I-17: PPP Configuration page

In the case of using your PPPoE server that is configured to always deliver the same IP address, select Dynamic IP address

Click the **Next** button to display the **WAN Interface Configuration** page.

WAN Interface Configuration

If your ISP requires a specific MAC address (e.g., for authentication), it can be entered on this page. The required MAC address can be entered into the **User defined** field**.** If a specific MAC address is not required, leave the default selection **This device** selected**.**

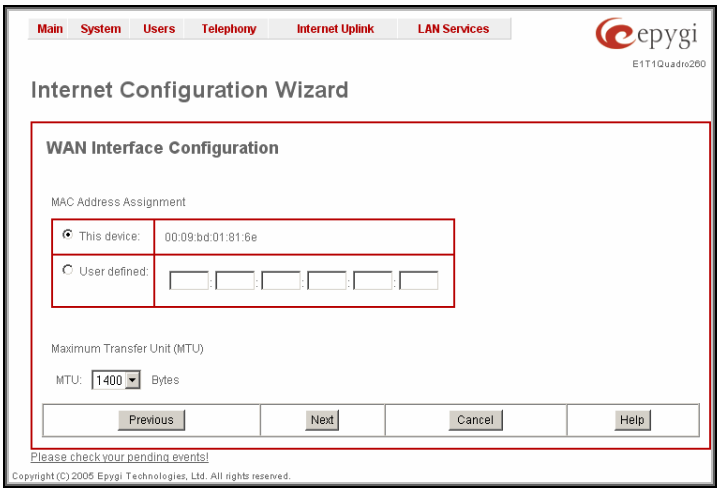


Fig. I-18: WAN Interface Configuration page

Click **Next** to display the **DNS Settings for the LAN Interface** page.

DNS Settings

Select **Fixed Nameserver** and enter its IP address. If you use your DHCP server and if it will deliver a DNS server, you may select **Dynamically by Provider**. When using a static IP address, fixed values must be entered.

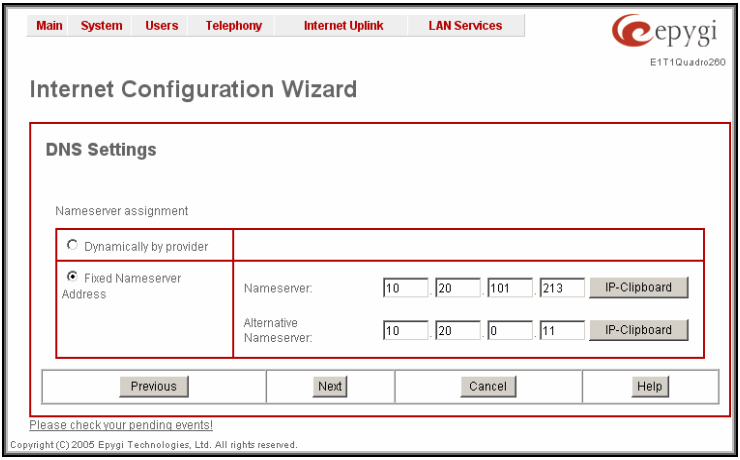


Fig. I-19: DNS Settings page

If **Ethernet** or **PPtP** is the selected WAN Interface protocol, clicking **Next** shows the summary page of the Internet Configuration Wizard**,** if **PPPoE** is the selected WAN Interface protocol, the next page will be **ISP Authentication Settings.**

ISP Authentication Settings

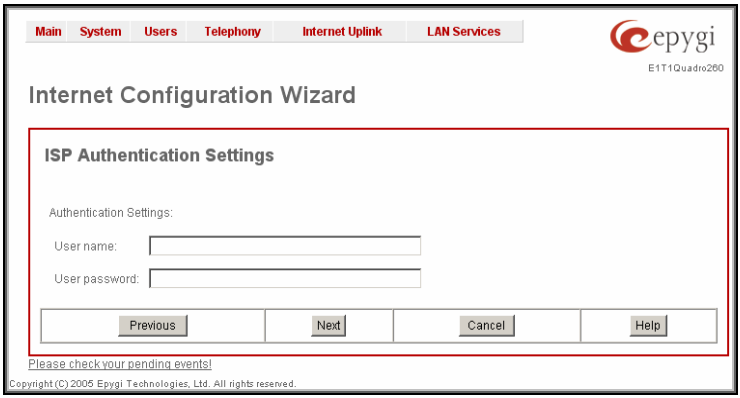


Fig. I-20: ISP Authentication Settings page

This applies only if PPPoE is your **WAN Interface** protocol.

Enter the authentication parameters provided by your Internet Service Provider (ISP).

Please Note: Typically, the User name is your email account, and the password is a string of characters.

Click **Next** to show **PPP Dial Settings** page.

PPP Dial Settings

This applies only if PPPoE is your **WAN Interface** protocol.

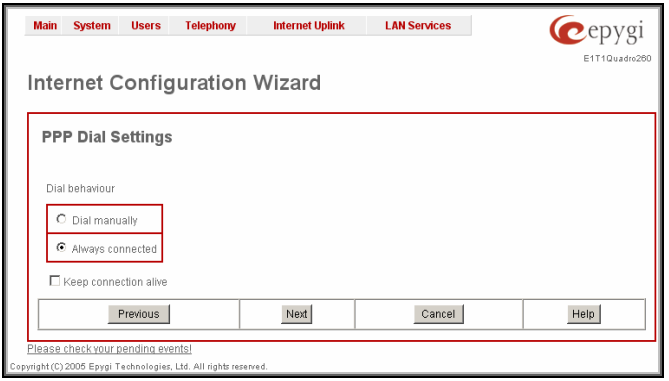


Fig. I-21: PPP Dial Settings page

The default value is **Always connected**.

Dial Manually enables a button on the main **Quadro Management** page to open or close the Internet connection manually.

The **Keep connection alive** checkbox is used to create some traffic to the Internet. It is useful, if your ISP disconnects you when there is no traffic on the link.

Click **Next** to show the summary page of the Internet Configuration Wizard:

Finishing the Internet Configuration Wizard

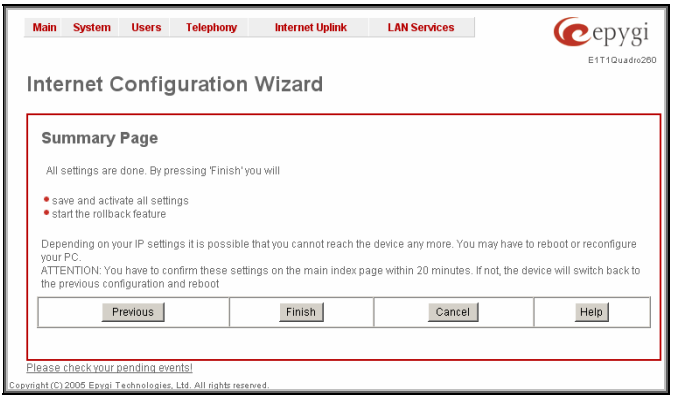

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
E1T1Quadro260
Internet Configuration Wizard
Summary Page
All settings are done. By pressing 'Finish' you will
save and activate all settings
start the rollback feature
Depending on your IP settings it is possible that you cannot reach the device any more. You may have to reboot or reconfigure your PC.
ATTENTION: You have to confirm these settings on the main index page within 20 minutes. If not, the device will switch back to the previous configuration and reboot
Previous
Finish
Cancel
Help
Please check your pending events!
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. I-22: Internet Configuration Wizard Summary page

Click the **Finish** button to complete the Internet Configuration Wizard. The Quadro will then stop internal functions and apply the changes made in the Wizard. After this is complete, the Quadro will reply with the **Confirm Settings** page requesting confirmation of the changes. Press the **OK** button to confirm the settings.

Please Note: you must confirm the settings within 20 minutes. If not, the device will **revert back to the previous configuration and reboot**.

Please Note: If you do not use DHCP for your LAN and you have changed your LAN settings, make sure that the IP address of the PC connected to QuadroE1/T1 is still within the specified IP address range. Otherwise, your PC might be unable to establish a connection to QuadroE1/T1.

If you changed the network configuration of the LAN, you may have to reboot your PC to get a new IP address from the new network. You can then access the Web Management of the QuadroE1/T1 on the new IP address you assigned to the QuadroE1/T1.

Your QuadroE1/T1 is now configured. If your QuadroE1/T1 has direct connectivity to the Internet, you may verify the functionality of IP calls now:

Dial **899#** and you will hear a voice message that confirms you successfully established an IP call. If this call is not successful, go to Appendix: Checking the Connections for trouble-shooting tips.)

To enable PSTN calls continue with the second step (Configuring the E1/T1 Settings) of the QuadroE1/T1 configuration and specify the E1IT1 Settings.

Configuring the Firewall

The Configuration of the firewall is only required if the Quadro is managed through the WAN port.

To configure the firewall, open **Firewall Configuration** from the **Security** menu, select **Filtering Rules** and configure the rule **Management Access** accordingly.

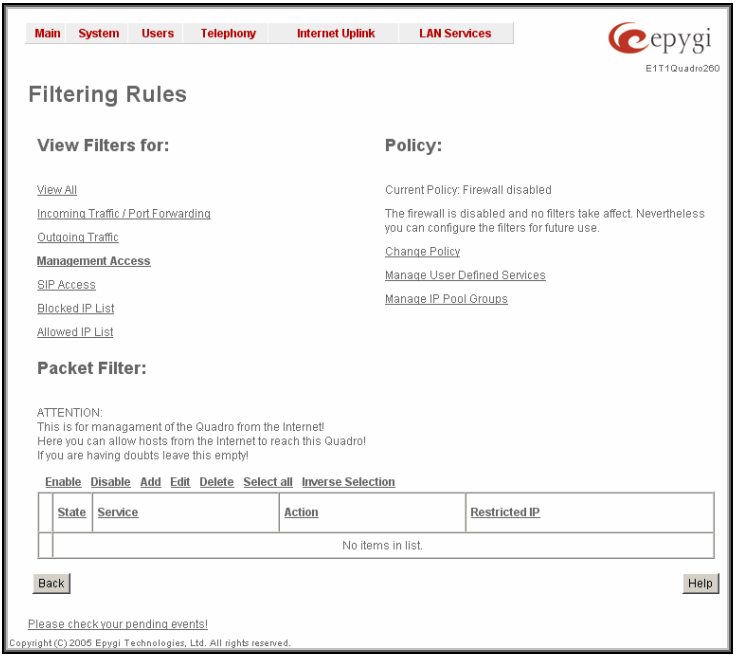


Fig. I-23: Filtering Rules page

Configuring the E1/T1 Settings

The QuadroE1/T1 can be connected to a PBX or to the PSTN via E1/T1 lines, using E1/T1 CAS/CCS signaling. The QuadroE1/T1 may be connected to act as a **User** (if connected to directly to the PSTN) or as a **Network** (if connected to a PBX).

Further, you are required to enter the E1/T1 settings your PSTN provider requires regarding framing, clocking, signaling used and so on. All these settings must be entered on the management page **Trunk Settings** that is displayed when you select **E1/T1 Settings** from the **Telephony** menu:

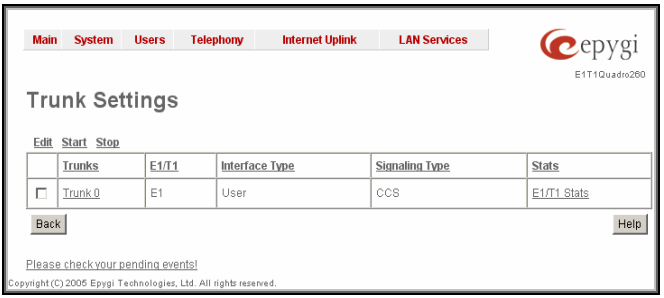


Fig. I-24: E1/T1 Trunk Settings page

The **Trunk Settings** page is used to configure the E1/T1 trunk and timeslots settings. The table lists the available E1/T1 trunks of Quadro and their settings (Trunk name, E1/T1 mode, interface and signaling type). Clicking on the trunk will open its **Signaling Settings** page (Trunk CAS Signaling Settings or the Trunk CCS Signaling Settings page depending on the selected signaling type). Selecting the corresponding trunk's checkbox and pressing **Edit** will open the **Trunk - Edit Entry** page. The **E1/T1 Stats** link is displayed for every active Quadro trunk and leads to the page where the E1/T1 trunk and the traffic statistics can be viewed.

Editing the E1/T1 Trunk

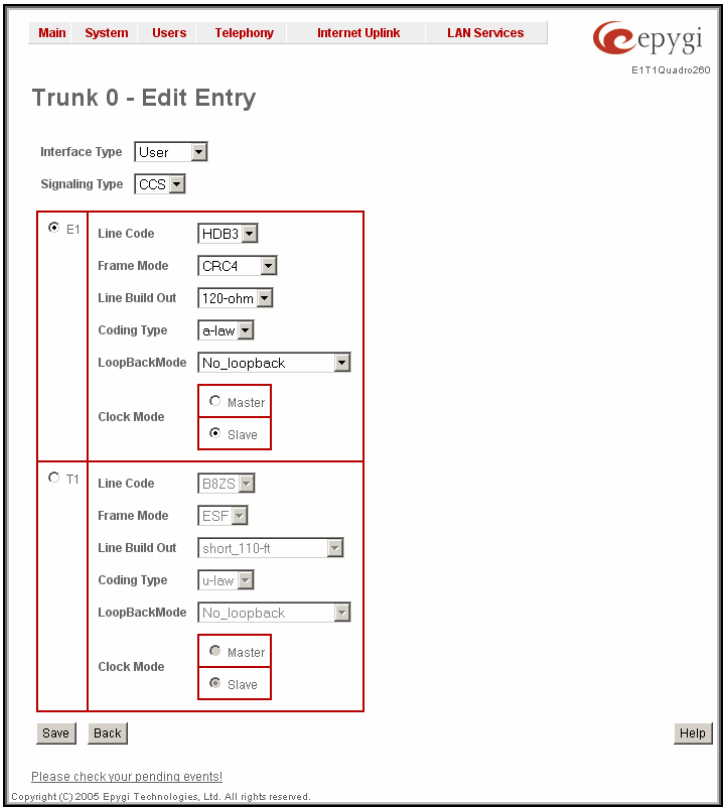


Fig. I-25: Trunk Edit page

Select **Network** as your **Interface Type** if your QuadroE1/T1 is connected to a PBX, otherwise choose **User.**

Next, you are required to enter the **Signaling type** (**CAS** or **CCS**), adjust the correct interface type (**E1** or **T1**), and specify the requested settings of the selected interface type. The appropriate parameters should be requested from the service provider or in case of connecting to a PBX - according to the settings in the PBX manual.

CAS signaling allows using the same timeslot both for voice and data transmission. CCS signaling uses a single timeslot for signaling data transmission for the whole trunk, all other timeslots are used for voice transmission.

E1, the European system, enables 30 active timeslots (both for CAS and CCS) to be used; T1, the US system, enables 24 timeslots (if CAS is used) and 23 (if CSS is used).

Please Note: Modifying the E1/T1 trunk settings may lead to some broken routes in the Local Call Routing Table.

Signaling Type CCS

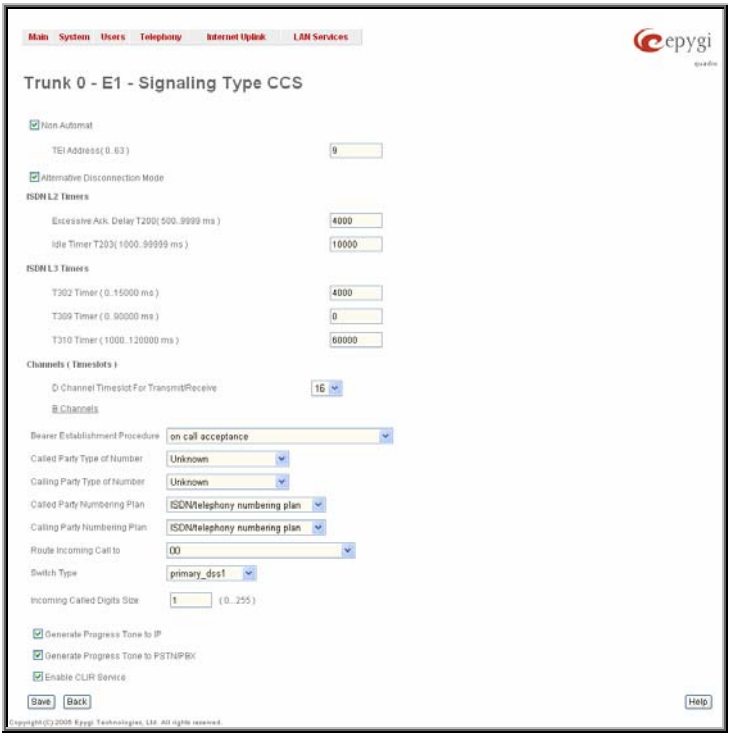


Fig. I-26: Trunk T1 Signaling Type CCS page

If you selected CCS as your Signaling Type, using the **Trunk** link will take you to the page shown above. Here you can specify the signaling settings in more detail. Further, this page allows selection of the timeslots for signaling data and voice.

The **Non Automat** checkbox switches to non-automatic Terminal Endpoint Identifier (TEI) searching and enables the **TEI Address** text field that requires a TEI number (digit values from 0 to 63) for connection establishment between CO and E1/T1 client. In automatic mode, an E1/T1 connection will be established on the first available TEI, while in non-automatic mode a specific TEI may be reserved for the connection. In this case both call partners need to specify the same TEI in their settings.

In the **Network Mode** (PBX connected) you need to specify the same TEI address on both sides (Quadro and PBX), if the **Non Automat** mode is selected. If the **Automat** mode is selected the user on the PBX side may set any mode related to TEI assignment in the PBX configuration.

In the **User Mode** (CO/PSTN connected) the TEI assignment depends on the CO/PSTN settings. So you have to enter the values you've got from your PSTN provider.

The **Alternative Disconnection Mode** checkbox should not selected, if Quadro ought to disconnect the call as soon as disconnect message has been received from the peer, otherwise, when checkbox is selected, Quadro's user may hear a busy tone when peer has been disconnected.

In the **ISDN L2 Timers** area the **Excessive Ack. Delay T200** text field configures the period in milliseconds (digit values from 500 to 9999) between transmitted signaling packet and its acknowledgement received. The **Idle Timer** T203 text field configures the period in millisec-

onds (digit values from 1000 to 99999) for E1/T1 client idle timeout. The Service Provider provides these settings.

In the **ISDN L3 Timers** area, the **T302 Timer** text field requires the value for the T302 timer in milliseconds (digit values from 0 to 15000) and indicates the time frame system is waiting for a digit to be dialed and when timer expires, it initiates the call. The timer is not applicable for DMS-100 switch types. The **T309 Timer** text field requires the value for the T309 timer in milliseconds (digit values from 0 to 90000) responsible for call steadiness during link disconnection within the period equal to this timer value. If the value in this field is 0, the T309 timer will be disabled. The **T310 Timer** text field requires the value for the T310 timer in milliseconds (digit values from 1000 to 120000) responsible for the outgoing call steadiness when CALL PROCEEDING is already received from the destination but call confirmation (ALERT, CONNECT, DISC or PROGRESS) is not yet arrived.

The D Channel Timeslot For Transmit/Receive drop down list in offers all available timeslots to be selected for signaling data transmit/receive.

The link **B Channels** leads to the **Signaling Type CCS - B Channel Settings** page (see below) where available timeslots may be enabled/disabled for the voice transfer. The **Force Update** option can be optionally used to apply new settings immediately. This will force the timeslot(s) to be restarted and any active connection on the selected timeslot(s) will be interrupted. **Edit** will display another page, where the signaling settings for the selected timeslots may be specified in detail.

Bearer Establishment Procedure allows to select the session initiation method on the B channels. One of the following possibilities of the transmission path completion prior to receipt of a call acceptance indication can be selected:

- on channel negotiation at the destination interface;
- on progress indication with in-band information;
- on call acceptance.

Called Party Type of Number and **Calling Party Type of Number** fields indicate correspondingly the type of the called party's and of the calling party's number.

Called Party Numbering Plan and **Calling Party Numbering Plan** drop down lists indicates correspondingly the numbering plan of the called party's and calling party's number.

The **Route Incoming Call to** drop down list contains Attendant, routing agent with two kinds of call routing possibilities, and all extensions of Quadro and allows selecting the destination where incoming calls will be routed to. Choosing **Routing** will request the caller to pass the authentication (if enabled) and will invite him to dial the destination number to connect the user within the Quadro Network. Choosing **Routing with inbound destination number** will request the authentication (if enabled) and then will automatically use the initially dialed number to connect the destination without any additional dialing.

Attention: When Quadro acts in the Network mode with the Attendant as a destination to route the incoming calls to, digit forwarding should be disabled on the private PBX side otherwise incoming digits may be mistaken as a special calling codes on the Quadro's Attendant.

The value for **Switch Type** depends on the CO when acting in the User mode and the private PBX capabilities when acting in the Network mode.

Attention: A timeslot can be used either for voice or signaling data transfer. The configuration prevents the selection of a timeslot from the B channel list if it has already been selected from the **D Channel receive/transmit** drop down list.

Incoming Called Digits Size indicates the number of received digits (in a range from 0 to 255) required to establish a call. When field has 0 value, the system uses either the timeout defined in the T302 field or the **Sending Complete Information Element** messages to establish a call. Independent from the value in this field, **Sending Complete Information Element** and pound sign always cause call establishment.

The **Generate Progress tone on IP** checkbox selection will generate the progress tone to IP (H.323 or SIP).

Select the **Generate Progress Tone to PSTN/PBX** checkbox to make Quadro generate ring tones to incoming callers during E1/T1 call dialing. This feature is mainly applicable to 2-stage dialing mode.

Selecting the **Enable CLIR Service** checkbox enables the Calling Line Identification Restriction (CLIR) service which displays the incoming caller ID only if Presentation Indication is allowed on the remote side. Otherwise, if the CLIR service is disabled, the caller ID will be unconditionally displayed.

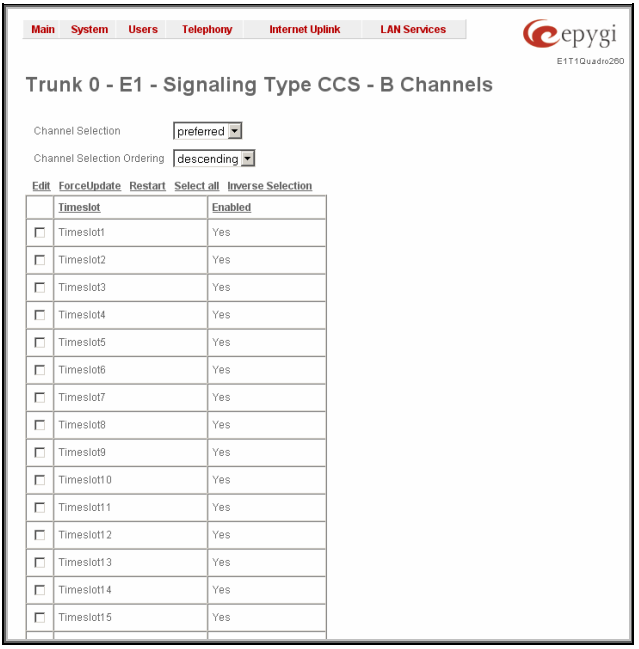


Fig. I-27: Trunk T1 Signaling Type CCS - B-Channels page

Edit will display the first page of the CAS signaling Wizard page (see below) where the signaling settings for the selected timeslots may be enabled or disabled and the **Force Update Timeslot** service may be enabled to apply new settings immediately. This will force the timeslot(s) to be restarted and any active connection on the selected timeslot(s) will be interrupted.

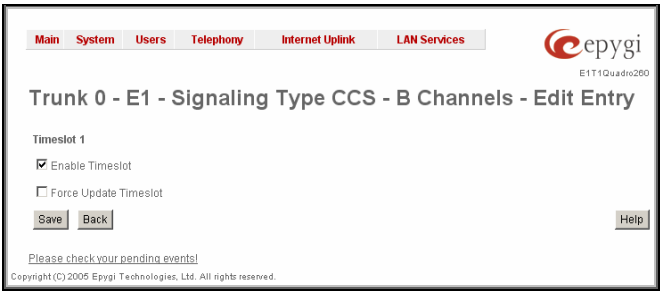


Fig. I-28: Trunk T1 Signaling Type CCS - B-Channels Edit page

Signaling Type CAS

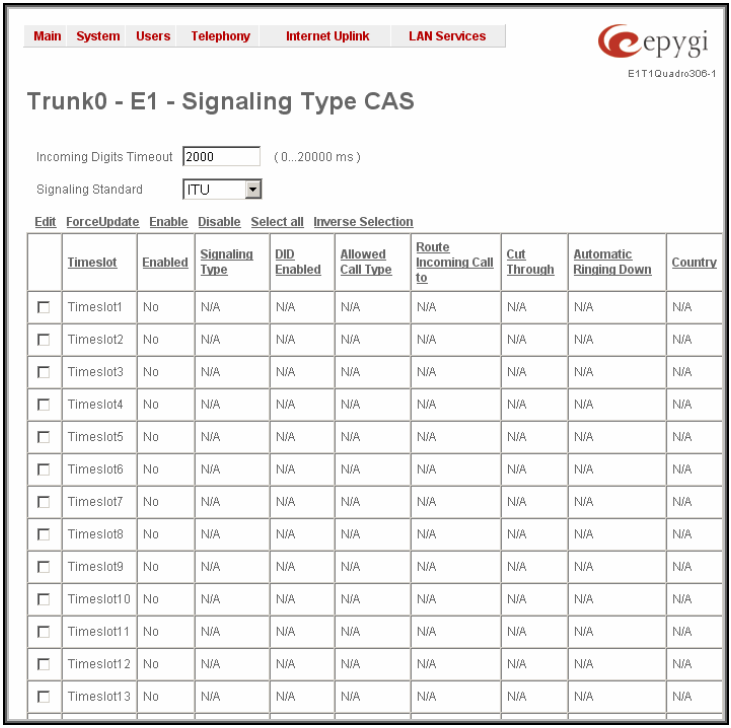

Main System Users Telephony Internet Uplink LAN Services
epygi
E1T1Quadro306-1
Trunk0 - E1 - Signaling Type CAS
Incoming Digits Timeout 2000 (0...20000 ms)
Signaling Standard ITU
Edit ForceUpdate Enable Disable Select all Inverse Selection
Timeslot Enabled Signaling Type DID Enabled Allowed Call Type Route Incoming Call to Cut Through Automatic Ringing Down Country
Timeslot1 No N/A N/A N/A N/A N/A N/A N/A
Timeslot2 No N/A N/A N/A N/A N/A N/A N/A
Timeslot3 No N/A N/A N/A N/A N/A N/A N/A
Timeslot4 No N/A N/A N/A N/A N/A N/A N/A
Timeslot5 No N/A N/A N/A N/A N/A N/A N/A
Timeslot6 No N/A N/A N/A N/A N/A N/A N/A
Timeslot7 No N/A N/A N/A N/A N/A N/A N/A
Timeslot8 No N/A N/A N/A N/A N/A N/A N/A
Timeslot9 No N/A N/A N/A N/A N/A N/A N/A
Timeslot10 No N/A N/A N/A N/A N/A N/A N/A
Timeslot11 No N/A N/A N/A N/A N/A N/A N/A
Timeslot12 No N/A N/A N/A N/A N/A N/A N/A
Timeslot13 No N/A N/A N/A N/A N/A N/A N/A

Fig. I-29: Trunk T1 Signaling Type CAS page

If you selected **CAS** as your **Signaling Type** on the **Trunk Settings - Edit Entry** page, you will get the page shown above using the **Trunk** link.

In the **Incoming Digits Timeout** text field the time period may be specified, during which incoming digits from the destination party calling Quadro will be collected before being applied as an incoming called number. Values between 0 and 20000 (in milliseconds) are required.

The **Signaling Standard** drop down list is available only in E1 mode and allows selecting the connection signaling standard (ITU, ITU_T_2 or MELCAS).

In the table below, the page lists all timeslots and allows editing of the signaling settings for each single timeslot with the help of the **CAS Signaling Wizard**.

Here you may **Enable** the **DID Service** (Direct Inward Dialing), specify the **Signaling Type Settings**, define the **Routing Settings** and configure **Country Settings** (available for E1, User Mode and R2 signaling) for one or more selected timeslots.

In **User** mode, the Quadro cannot route incoming calls from the E1/T1 trunk to extensions if the timeslot in the trunk does not have DID service enabled. Incoming call routing takes place according to the received caller ID. If the DID service is enabled on some timeslot(s), an incoming call on these timeslots may be routed to the specified extension, the Attendant, or the routing client (depending on the configuration).

Please Note: The timeslot with DID service enabled cannot be used for outgoing calls.

In **Network** mode DID service does not limit the Quadro functionality but a timeslot with enabled DID service cannot be used for incoming calls.

Please Note: The CO/private PBX must support the DID service, if it is to be configured on the QuadroE1/T1.

Setting up Call Routing

The Call Routing service allows you to specify the communication structure between all involved devices by developing a dialing plan and setting the call routing paths accordingly. For the Quadro extension users, the call procedure should be simple and familiar for all kinds of calls (internal, SIP, H.323, PSTN or IP-PSTN).

The possibilities Call Routing offers are numerous. The following configuration just a single example used to explain setup of the QuadroE1/T1 as a gateway:

In this example, the QuadroE1/T1 is connected within a protected Private Data Network built of two other Quadro devices (-2x and -4x) where 6 extensions are connected. Each extension will be configured such that they all shall reach each other and the PSTN. The extensions also shall be reached by calls from the PSTN.

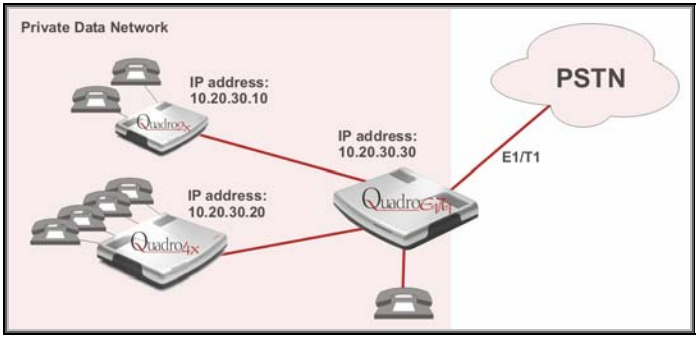


Fig. I-30: Call Routing example

Your PSTN Service Provider supplies you with a set of PSTN telephone numbers for your E1/T1 line. If you want to assign these numbers to the phones connected to the Quadro2x and Quadro4x within your Private Data Network, you have to create a dial plan to define **Call Routing paths** on the QuadroE1/T1 and on each of the other Quadro devices.

To illustrate the dial plan with an example, we will assume, you have the phone number set 854603-30 to 854603-59 and you assigned the numbers as follows:

Quadro 2x (IP: 10.20.30.10)		**Quadro4x** (IP: 10.20.30.20)		**QuadroE1/T1** (IP: 10.20.30.30)	
Auto Attendant	854603-30	Auto Attendant	854603-40	Extension 1	854603-50
Extension 1	854603-31	Extension 1	854603-41	Auto Attendant: All numbers of the numbers set, that are not assigned to an extension are caught here	
Extension 2	854603-32	Extension 2	854603-42		
		Extension 3	854603-43		
		Extension 4	854603-44		

All unassigned numbers of the phone number set will lead to the Auto Attendant of QuadroE1/T where a message may inform the callers that the dialed number does not exist.

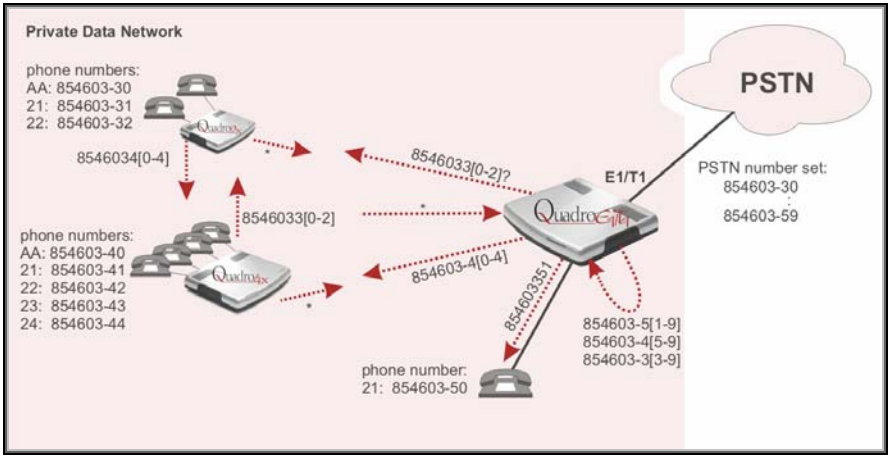


Fig. I-31: Call Routing example; dialing plan

To define the call routing paths needed on QuadroE1/T1 open **Call Routing** in the **Telephony** menu and select **Local Routing Table**. The **Call Routing - Local Routing** page will be displayed (it is a wide table, thus it is shown here in two parts):

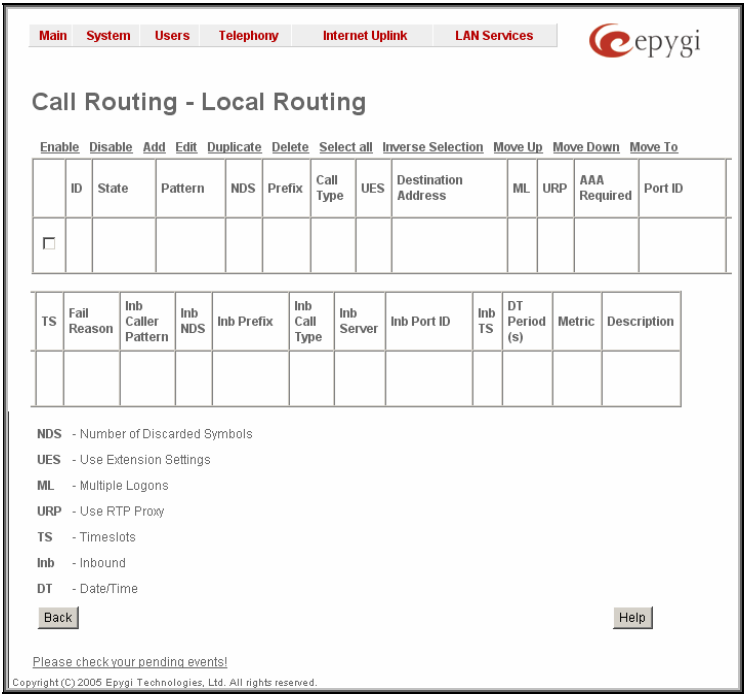

Main System Users Telephony Internet Uplink LAN Services
epygi
Call Routing - Local Routing
Enable Disable Add Edit Duplicate Delete Select all Inverse Selection Move Up Move Down Move To
ID State Pattern NDS Prefix Call Type UES Destination Address ML URP AAA Required Port ID
TS Fail Reason Inb Caller Pattern Inb NDS Inb Prefix Inb Call Type Inb Server Inb Port ID Inb TS DT Period (s) Metric Description
NDS - Number of Discarded Symbols
UES - Use Extension Settings
ML - Multiple Logons
URP - Use RTP Proxy
TS - Timeslots
Inb - Inbound
DT - Date/Time
Back
Help
Please check your pending events!
Copyright (C) 2005 Epygi Technologies, Ltd. All rights reserved.

Fig. I-32: Call Routing - Local Routing page

Before you can start defining the local call routing paths, you have to select **Add** to define the first call routing path that leads the incoming PSTN calls 854603-30, -31 and -32 to the Quadro2x.

Fig. I-33: Local Call Routing Wizard: Routing Call Type Add Entry page 1

Pattern requires the routing pattern. To make the specified call, the appropriate Call Code should be dialed prior to the routing pattern. Only digit values and wildcard symbols are allowed here:

- the "?" character stands for only one unknown digit
- the "*" character stands for any number of any digits.
- '[' , ']' , ',' and '-' are used to define a range or a quantity of numbers, e.g. 8546033[0-2] means that the dialed number may be 8546033-0. -1 or -2 to match the specified pattern; for 2[3,7], the dialed number may be 23 or 27 to match the specified pattern.

Number of Discarded Symbols (NDS) specifies the number of digits that that should be discarded from the beginning of the routing pattern. In this example, no digits have to be discarded, so leave that field empty.

Prefix specifies digits that will be inserted at the beginning of the routing pattern. Leave the field empty if no digits need to be added.

Suffix specifies digits that will be inserted at the end of the routing pattern. Leave the field empty if no digits need to be added.

Call Type gives a possibility to select the routing call type (PBX, SIP, H.323, IP-PSTN or E1/T1). For this example **SIP** has to be selected.

Metric allows entry of a rating for the selected route in a range from 0 to 20. If no value is inserted into this field, 10 will be used as a default. When two route entries match a user's dial string, the route with the lower metric will be preferred. In this example the **Metric** field will be left empty.

Description allows entry of short text, e.g. to name the path.

Filter on Caller/Call Type Modify Caller ID allows to limit the functionality of the current route to be used by the defined caller(s) only. If this checkbox is enabled, inbound caller information (Inbound Caller Pattern, Inbound Call Type, Inbound Port ID, etc.) will be required

later in the Local Call Routing Wizard (see Manual-II, Administrator's Guide). In this example, no caller specific limitation is needed, so leave that checkbox unchecked empty.

Please Note: This checkbox selection, as well as any Inbound Caller information inserted, won't be considered and will make the current routing pattern invalid, if the E1/T1 Settings are switched to CAS mode, Loop Start, Group Start, E&M, R2 DTMF or R2 Compelled/Non Compelled (without ANI) signaling types.

Set Date/Time Period(s) allows setting a time period, during which the route shall be valid. For this purpose, and own page is displayed as the third page of the Local Call Routing Wizard.

Next will display the second page of the **Local Routing Wizard**:

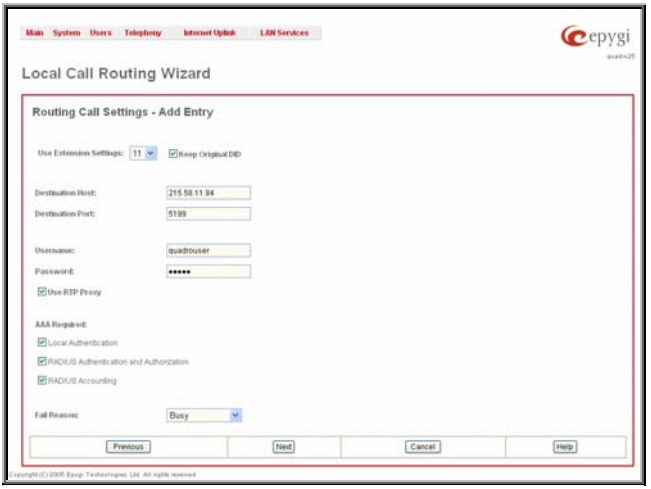


Fig. I-34: Local Call Routing Wizard: Routing Call Settings - Add Entry page 2

Use Extension Settings is applicable to SIP and IP-PSTN call types only and allows to select the extension (also Auto Attendant) on behalf of the call that will be placed. The SIP settings of the selected extension will be used as the caller information. If no entry is selected in this list, the original caller information will be kept. If the **Keep original DID** checkbox is selected, the called destination will receive the original caller's information, rather than the information of extension selected from the **Use Extension Settings** list.

Destination Host and **Destination Port** require the host name or the IP address and the port number of the destination or the SIP server. As Quadro devices use port 5060 per default, enter **5060**.

User Name and **Password** are identification settings for public SIP servers or servers requiring authentication. Leave these fields empty.

Use RTP Proxy checkbox is available for SIP, H323 and IP-PSTN call types and is applicable only when route is used for calls through Quadro between peers both located outside the Quadro. When this checkbox is selected, RTP streams between external users will be routed through Quadro, otherwise, when checkbox is not selected, RTP packets will be moving directly between peers.

AAA Required is used to choose between one or more Authentication, Authorization and Accounting (AAA) options:

- **Local Authentication**: Callers will need to pass authentication through Local AAA table (see below) when dialing the current pattern.
- **RADIUS Authentication and Authorization** is available for all call types except PBX calls, if the RADIUS client is enabled. When dialing the current pattern, the callers will

need to pass the authentication defined within the Local AAA table, and if the authentication fails, on the RADIUS server.

- **RADIUS Accounting** is available for all call types except PBX calls if the RADIUS client is enabled. With this option, no local authentication will take place, but a caller identifying CDR (call detail report) will be sent to the RADIUS server.

  If the authentication is configured based on the caller's address, callers will pass the authentication automatically; otherwise they will be required to identify themselves by a username and a password.

  In the example described here, no authentication is desired, so do not select any of **AAA Required** checkboxes.

Fail Reason offers a list of fail reasons depending on the selected call type. If the selected fail reason occurs, the local routing table will be parsed for the next matching pattern, and if found, the call will be routed to the destination specified there.

In the example described here, the default value **None** is used.

Use Extension Settings allows to select the extension (also Auto Attendant) on behalf of the call that will be placed. The SIP settings of the selected extension will be used as the caller information. If no entry is selected in this list, the original caller information will be kept.

If the **Set Date/Time Period(s)** checkbox has been checked on the first page of the Local Call Routing Wizard, the following page is displayed to specify one ore more time periods during which the path shall be valid:

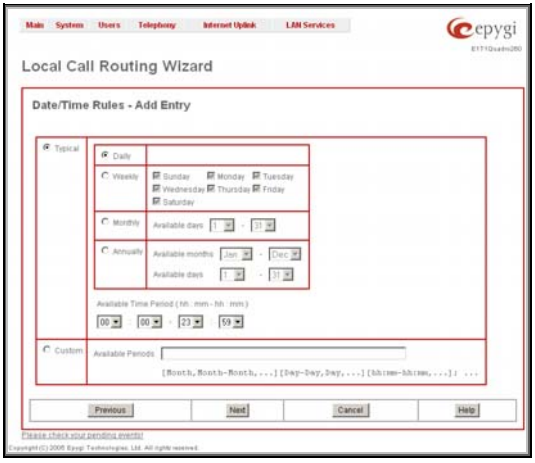


Fig. I-35: Call Routing Wizard: Date/Time Rules - Add Entry page

The last page of the Local Call Routing Wizard summarizes all settings and **Finish** will save the route. The **Call Routing - local Routing** page is displayed again showing the new call routing path.

All the other paths have to be specified accordingly on Quadro E1/T1 and the other involved Quadro devices:

QuadroE1/T1

Pattern	NDS	Prefix	Call Type	Destination Address	Description
8546033[0-2]			IP	10.20.30.10	path to Quadro2x
8546034[0-4]			IP	10.20.30.20	path to Quadro4x
85460350			PBX		path to phone connected to QuadroE1/T1
8546033[3-9]	8	00	PBX		path to AA for not used numbers -3
8546034[5-9]	8	00	PBX		path to AA for not used numbers -4
8546035[1-9]	8	00	PBX		path to AA for not used numbers -5
*			E1/T1		path for all outgoing calls to PSTN

Quadro2x

Pattern	Call Type	Destination Address	Description
89546034[0-4]	IP	10.20.30.20	path to Quadro4x
*	IP	10.20.30.30	path for all outgoing calls via QuadroE1/T1 to PSTN

Quadro4x

Pattern	Call Type	Destination Address	Description
89546033[0-2]	IP	10.20.30.10	path to Quadro2x
*	IP	10.20.30.30	path for all outgoing calls via QuadroE1/T1 to PSTN

Registering on Epygi's Technical Support

It is recommended that you register your QuadroE1/T1 on the Epygi Technical Support web page. Registration will give you access to the Technical Support Database. There, you can send requests concerning technical problems as well as refer to the frequently asked questions. In addition, the technical support page allows users to download new firmware, manuals and other information. You can access the support section only if you are registered. Additionally, registration at Epygi's Technical Support web page gives you the username and password to login to the Epygi SIP Server.

To register, you need to know the serial number of your QuadroE1/T1, which you will find on QuadroE1/T1's bottom label and its purchase date. Next, open the Epygi home page (www.epygi.com), select **Support** and click on **Registration Form**. The online registration page will appear:

Complete all fields and record the **Login Name** and **Password** in a safe place. You will need it for the SIP server.

Please Note: In some cases the QuadroE1/T1 units will be shipped pre-configured from the factory with the Support login and password already set-up. In this case, an information sheet is included in the packaged contents indicating the username/password to access Epygi's online Support and the Epygi SIP Server.

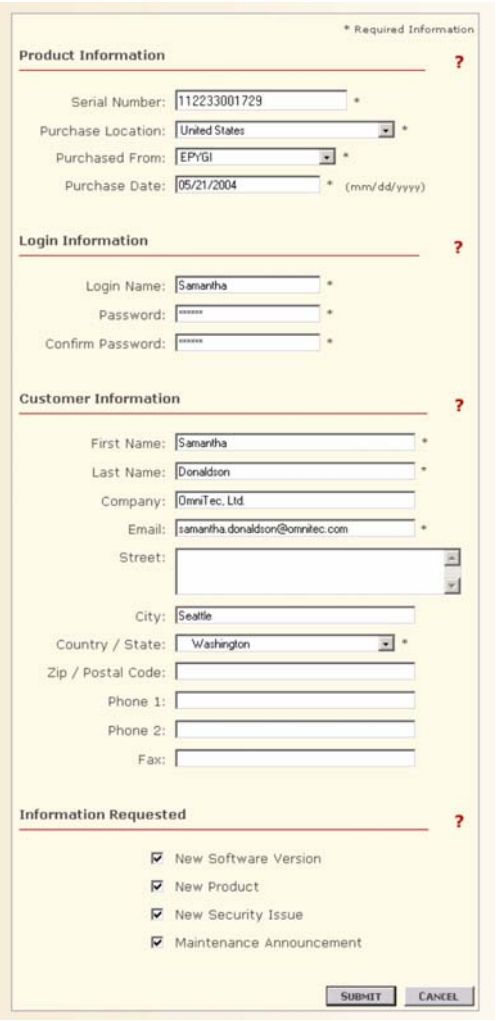


Fig. I-36: Registration form

Appendix: PC DHCP Settings

The QuadroE1/T1 LAN port has a DHCP server that provides DHCP IP addresses to devices connected to the LAN either directly or through an Ethernet hub or switch. Appendix A describes how to configure Windows PCs for DHCP. The PC used to access the QuadroE1/T1 must meet the following conditions:

- TCP/IP network protocol has to be installed.
- DHCP has to be activated to request the IP address automatically.

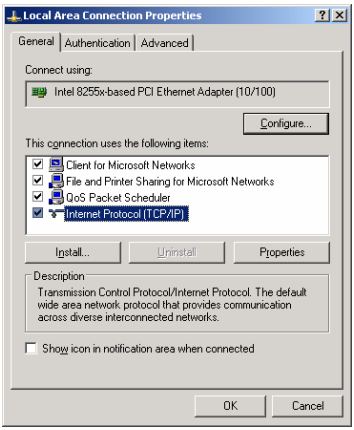
Please Note: If your PC is already configured for DHCP, then simply power it on. Verify the LAN LED is lit. If not, check the cable connections.

Follow the instructions below to install TCP/IP and enable DHCP functionality:

TCP/IP and DHCP under Windows 2000/Windows XP

Windows 2000 and Windows XP PCs with Ethernet cards or adapters normally are configured with a TCP/IP network connection by default. Nothing additional needs to be installed. To enable the DHCP functionality, you may have to modify the properties of TCP/IP:

1. Click the **Start** button. Choose **Settings**, then **Control Panel.**
2. Double-click on the **Network Connection** icon to open the corresponding window. Select **Local Area Connection** with the right mouse button and select **Properties.**


Local Area Connection Properties
General Authentication Advanced
Connect using:
Intel 8255x-based PCI Ethernet Adapter (10/100)
Configure...
This connection uses the following items:
Client for Microsoft Networks
File and Printer Sharing for Microsoft Networks
QoS Packet Scheduler
Internet Protocol (TCP/IP)
Install... Uninstall Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Show icon in notification area when connected
OK Cancel

3. Highlight **Internet Protocol (TCP/IP**) and click **Properties**. The corresponding window will be displayed.

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

4. Select **Obtain an IP address automatically,** then click on **Advanced.**

.

5. You will see the entry **DHCP Enabled.**
6. Click **OK** three times to close all windows.

TCP/IP and DHCP under Windows 95/98/ME

1. Click the **Start** button. Choose **Settings**, then **Control Panel.**
2. Double-click on the **Network** icon to open your Network window. Select the **Configuration** tab.
3. Click **Add.**
4. Double-click on **Protocol**.
5. Highlight “Microsoft” under the list of manufacturers.
6. Find and double-click on **TCP/IP** in the list to the right.
7. The Network window will appear with the TCP/IP protocol now listed.
8. Highlight “TCP/IP” and click on **Properties**.
9. Select **Getting IP address automatically** to enable the DHCP functionality.
10. Click **OK.**
11. Windows will ask you to restart the PC. Click **Yes.**

The TCP/IP installation is now complete and the DHCP functionality is enabled.

Appendix: Changing the Administrator's Password

For security reasons, it is recommended that you change the default admin password. The username of the administrator, **admin** cannot be changed.

Under the **Telephone Users** menu, select **Change Password.**

The **Change Password** page will be displayed.

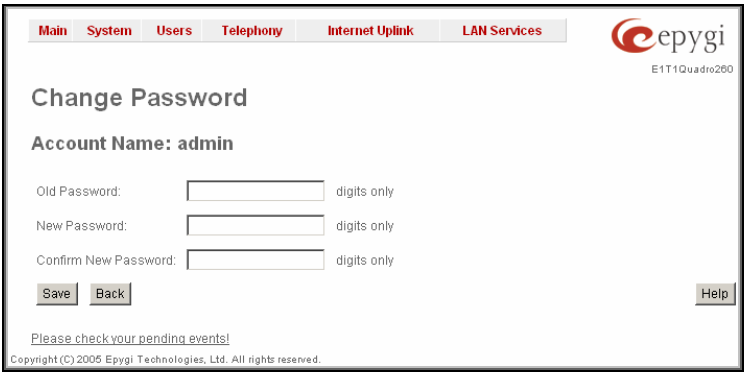


Fig. I-37: Change Password page

Enter the **Old Password** (19) and the **New Password** in both the **New Password** and **Confirm New Password** fields. Please note that only alphanumeric characters may be entered here.

Save the password in a secure place. If the password is lost, a factory reset will need to be carried out on the unit (see Administrator's Manual, Hardware Overview). All settings are lost after a factory reset. After a factory reset, the default password (19) will be restored.

Appendix: Configuring SIP NAT Traversal

The QuadroE1/T1 initiates and receives SIP calls from the network connected to the WAN port). In order to receive SIP calls, the QuadroE1/T1 must be able to receive packets from the SIP server or any other device that is trying to make an incoming call. If the QuadroE1/T1 is placed behind a router with NAT, like most basic routers on the market today, the QuadroE1/T1 will not be able to receive calls. To resolve this issue, either STUN must be enabled on the QuadroE1/T1 or SIP NAT traversal must be set up in the router and in the QuadroE1/T1 to properly route the incoming calls.

NAT or Network Address Translation is a common feature used to expand the use of connected PCs and other networked devices without having to use multiple global Internet public IP address. Most ISP will assign one public IP address to each customer that is connected to the Internet. The customer can use a router to provide NAT capability and create a private network of PCs and other devices not visible to the Internet. This method offers security and also eliminates the need to assign global Internet public IP addresses to each device.

Please Note: SIP NAT traversal only works with Internet connections that have static IP addresses. Verify from your provider this is the case for your Internet connection. Some ISPs provide dynamic IP addresses that may change from time to time, and are not appropriate for SIP NAT traversal.

Please Note: If you have more than one router in series between the QuadroE1/T1 and the Internet, the same port forwarding setup must be configured on each router.

SIP NAT Traversal Setup

- Install the QuadroE1/T1 behind the router. If the QuadroE1/T1 is configured with its factory default settings, it is already configured for DHCP and will obtain an IP address automatically from the router. If the DHCP was changed, please Run the System Configuration Wizard to place the QuadroE1/T1 in DHCP mode. Power up the QuadroE1/T1.
- Connect a PC or laptop to the QuadroE1/T1 LAN port and power it up.
- Verify the QuadroE1/T1 can connect to the Internet by opening a browser window and browsing to a familiar WEB site. If the QuadroE1/T1 can not reach the Internet, verify the LAN/WAN LEDs and the cabling. Verify the QuadroE1/T1 is set up for DHCP on the WAN and that the router has the DHCP server enabled for the devices behind it.
- Find the address of the router and log into the router. Refer to the router user manual on how to open the router configuration.
- Set up port forwarding on the router to forward the UDP ports according to the ports specified for SIP (Mapped Port for SIP, default: 5060) and RTP/RTCP (Min mapped RTP/RTCP port (default 6000 and Max mapped RTP/RTCP port (default 6099)) on the QuadroE1/T1. The router should forward that UDP (USP/TCP for SIP) ports to the IP address assigned to the QuadroE1/T1. You can see the IP address of the QuadroE1/T1 in the System menu under Status. The IP address will be listed as the WAN IP address. Your router may also indicate the IP address assigned to the QuadroE1/T1.
- Find out the public Internet address of the router. To do so, open a browser and go to www.whatismyip.com. The site will return your public Internet IP address. Record this IP address.
- From the **QuadroE1/T1 Management** menu go to the **SIP Settings** menu and check **Use Manual NAT Traversal for SIP**. For **NAT station IP,** enter the public Internet IP address found on the step above and the port numbers for SIP and RTP/RTCP. The default values are:
- For Mapped Port for SIP 5060
- For Min mapped RTP/RTCP port 6000
- For Max mapped RTP/RTCP port 6059

- Click the **Save** button to save the contents.

The QuadroE1/T1 will activate the settings and register the extension on the Epygi SIP Server after a few minutes. You can verify the settings from the main **QuadroE1/T1 Management** menu under **Status** in the **SIP Registration Status** section.

Appendix: Checking the Connections

If the system seems to work incorrectly even when all cables are connected properly, it may be helpful to **Start Network Diagnostics:** The WAN link, IP configuration, gateway, DNS server, and STUN-NAT (if used) will all be checked.

To start diagnostics, open the **System's** menu item **Diagnostics** and click **Start Network Diagnostics.**

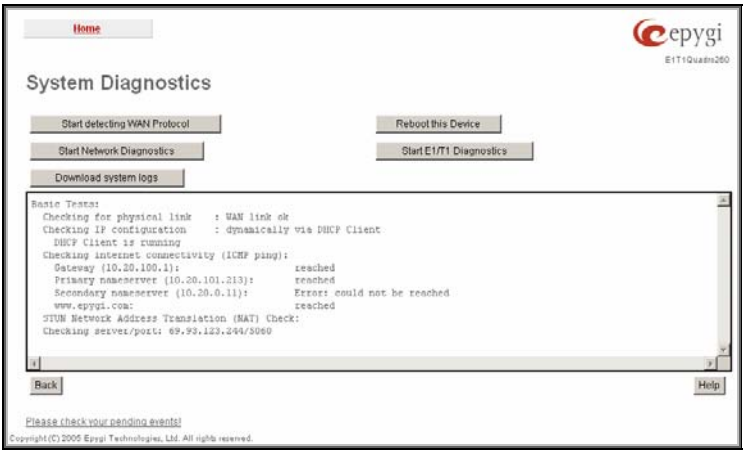


Fig. I-38: System Diagnostics page

In the case of a successful test, the output of the system looks as follows:

```
Basic Tests:
  Checking for physical link:                WAN link ok
  Checking IP configuration:                 dynamically via DHCP Client
    DHCP Client is running
  Checking internet connectivity (ICMP ping):
    Gateway:              reached
    Primary nameserver:   reached
    Secondary nameserver: not configured
    www.epygi.com:        reached
  STUN Network Address Translation (NAT) Check:
    External visibible address: 212.126.210.179
    Detected NAT type         : Restricted cone

  Performing MTU Discovery:
    preparing system
    Sending UDP Datagram of size 1500        got answer
    clean up

  Largest usable MTU size is: 1500 Bytes

Test successful.
```

Depending on where the test is failing, the diagnostic can give some advice to solve the problem. See the example below of a failed test:

```
Basic Tests:
  Checking for physical link:                no WAN link

Please check the physical connection of the WAN interface. Cable not
plugged or broken?

Test failed.
```

If you pass the diagnostics successfully, but are still not able to place a call to 899# then check the SIP registration status.

Open the SIP Registration Status page using the QuadroE1/T1 management **System** menu item **Status**. If QuadroE1/T1 is placed behind a NAT router, the detected NAT type and the IP address of this router's WAN port is displayed.

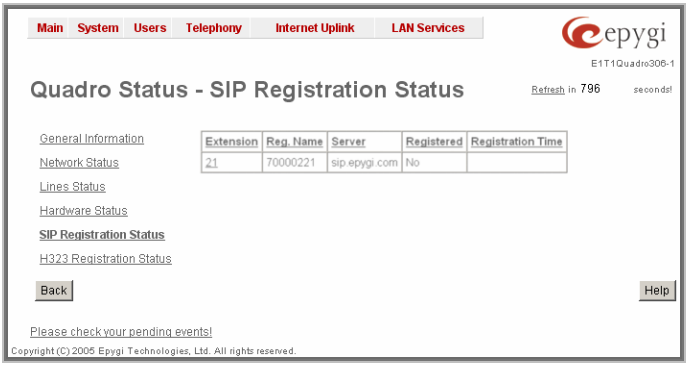


Fig. I-39: SIP Registration Status page

If you are using the STUN functionality the page shown above will additionally display the Detected Connection Type. Unsupported Connection types will cause one of the following messages:

- Unknown connection - unexpected error,
- Symmetric NAT,
- Symmetric Firewall,
- Blocked UDP

If the **Detected Connection Type** is any of the types listed above, QuadroE1/T1 cannot work behind your router. You must either connect the QuadroE1/T1 in front of the router, or configure NAT traversal manually as explained in **Appendix: Configuring SIP NAT Traversal**

If you are unable to resolve your problems, please send us a technical support request on the **Support** section of **http://www.epygi.com/.** Please prepare a system log file and attach it to your request. To create a system log file, open the **System Diagnostics** page **System** menu item **Diagnostics**) and click **Download System Logs**.

Appendix: Pin Assignment of E1/T1

Pin	Signal
1	RXRING
2	RXTIP
3	N.C.
4	TXRING
5	TXTIP
6	N.C.
7	N.C.
8	N.C.

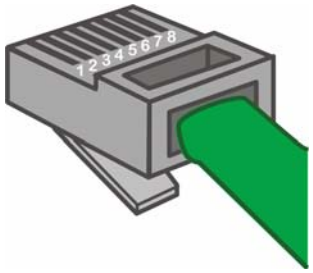
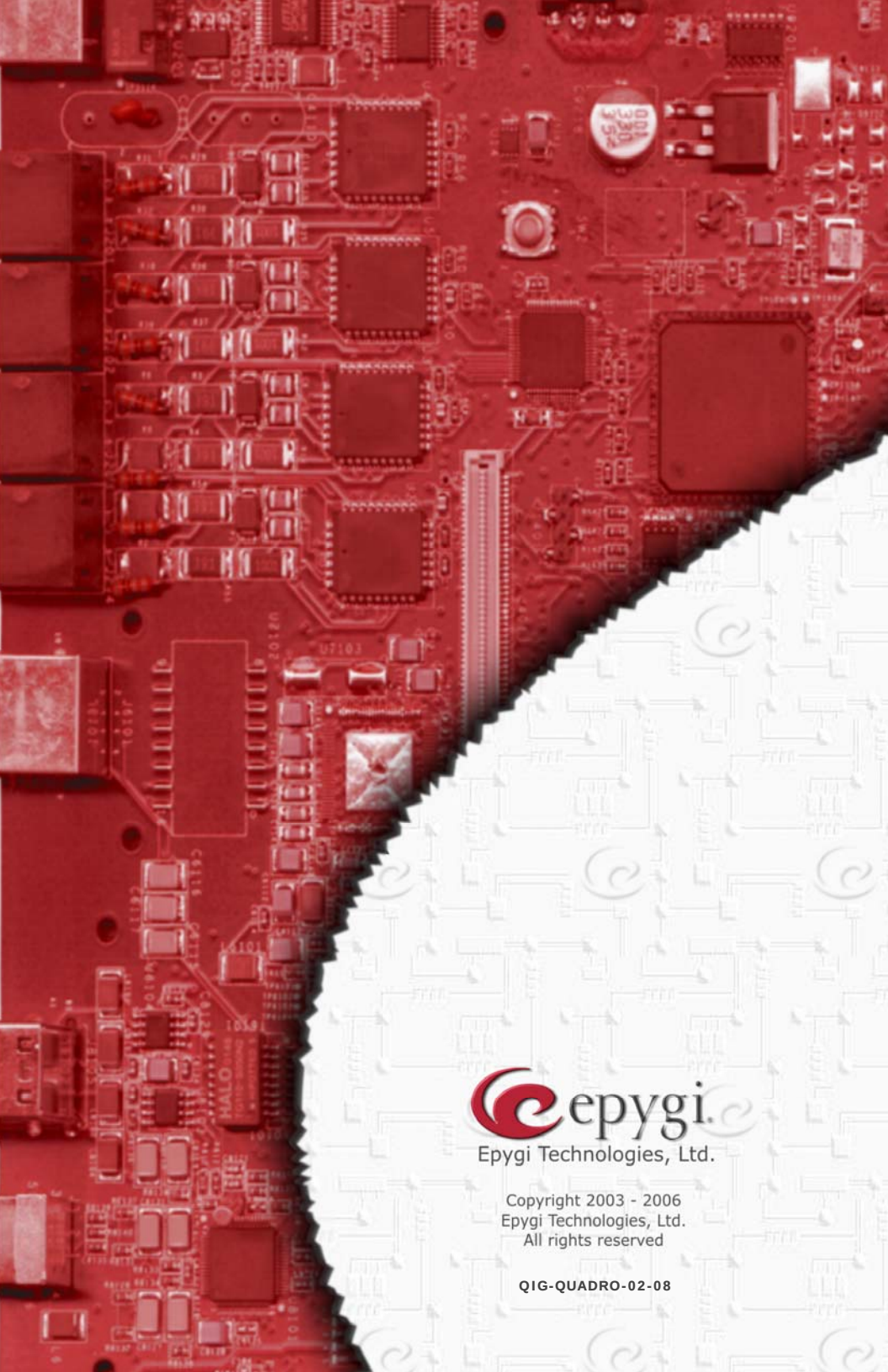


Fig. I-40: Pin Assignment of E1/T1



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